



Marvyn Inga

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Education

University of Campinas (UNICAMP)

M.Sc. & Ph.D. in Physics

São Paulo, Brazil

Current

National University of Engineering (UNI)

B.Sc. in Physics

Lima, Peru

2013

Summary

- Experience working with optics and photonics, with emphasis on free-space and fiber optics experiments.
- Strong capacity to design science experiments and automate sophisticated scientific instruments.
- Proficient in a variety of specialized computer programs to simulate, acquire, analyze, and visualize data.
- Considerable experience teaching students at the undergraduate level.

Languages

English Professional

Spanish Native

Portuguese Fluent

Projects

Dispersion engineering in optical microcavities

UNICAMP, 2020

We tailored the group velocity dispersion (GVD) of silica microresonators using different methods. In wedge microresonators, we tuned the GVD controlling the sidewall angle without affecting the free spectral range [↗](#). In spherical microresonators, we used alumina coating of different thicknesses with the same intention [↗](#). We reported these methods in scientific journals showing the capability of both microresonators to produce tailored optical frequency combs. Here we learned about whispering-gallery microcavities, dispersion, dispersion control, atomic layer deposition, four-wave mixing, and optical frequency combs. This project was an excellent opportunity to acquire new knowledge and skills to communicate equipment from our hardware, analyze millions of data points, and optimize processes using several Python libraries. Being aware of the importance of open access in science, we deposited all material used in this project in Zenodo [↗](#).

Tunable light filters

SAMSUNG & UNICAMP, 2017

It was a partnership between SAMSUNG and the Device Research Laboratory (LPD-Unicamp) where I participated in contributing to the colour theory transformations and algorithms necessary to identify colors emitted by the homemade filters. For this, we used an spectrometer and a Python [package](#) for colour science.

High sensitivity spectroscopy

UNICAMP, 2015

We demonstrated the possibility of using optical cavities of moderate finesse for measurements of small absorption coefficients of nearly transparent liquid and solid samples. With this sensitive technique, based on measurements of ring-down times, I could isolate the absorption coefficient of liquids contained inside a transparent cuvette oriented at Brewster's angle. This project served to acquire experience working on spectroscopy and free-space optics.

Magnetic properties of CuO₂ nanoparticles on graphite and graphene

UFABC, 2012

Here, I focused on obtaining graphene from highly oriented graphite blocks using the scotch tape method. Afterwards, we obtained nanoparticles by laser ablation and deposited on graphene samples. The optical and magnetic characterization of the samples were done with the intention of detect changes in their properties.

Publications

Journals

- **M. Inga**, L. Fujii, J. M. da Silva Filho, J. Quintino, A. Ferlauto, F. C. Marques, T. P. M. Alegre, and G. S. Wiederhecker. Alumina coating for dispersion management in ultra-high Q microresonators. Submitted to APL-Photonics. [↗](#)
- L. Fujii, **M. Inga**, J. H. Soares, Y. A. V. Espinel, T. P. Mayer Alegre, and G. S. Wiederhecker. Dispersion tailoring in wedge microcavities for Kerr comb generation. Optics Letters Vol. 45, Issue 12, pp. 3232-3235 (2020). [↗](#)

Conferences

- **M. Inga**, L. F. dos Santos, J. M. C. da Silva Filho, Y. A. V. Espinel, F. C. Marques, T. P. M. Alegre, and G. S. Wiederhecker. Tailoring group-velocity dispersion in microspheres with alumina coating. In CLEO, pp JTh2C.4. Optical Society of America (2020). [↗](#)
- L. Fujii, **M. Inga**, J. H. Soares, T. P. Mayer Alegre, and G. S. Wiederhecker. Dispersion Control in Silicon Oxide Wedge Microdisks. In CLEO: QELS Fundamental Science, pp. JTu2A-111. Optical Society of America (2018). [↗](#)

Teacher Internship Programs

Electric Circuits and Electromagnetism

UNIVESP, 2019-II

Employed on a temporary contract by the UNIVESP in teaching-related responsibilities.

Experimental Physics IV: Alternating Current and Optics

UNICAMP, 2015-II, 2016-II

Participating in the Docent Training Stage Program at UNICAMP.

Experimental Physics III: Electricity and Magnetism

UNICAMP, 2014-II, 2016-I

Participating in the Docent Training Stage Program at UNICAMP.

Professional Affiliations

Optical Society of America (OSA)

2007-Current

Founder member of the OSA Student Chapter UNI, Lima, Peru. Currently, as a member of the OSA Student Chapter UNICAMP, São Paulo, Brazil.

Computer skills

- I use Latex for scientific reports and Mendeley as a reference manager. To create and edit vectorial images for publication, I use Inkscape. Frequently, my presentations have been done in LibreOffice Impress or Beamer.
- Because Office 365 is free for academic institutions, I usually use Microsoft Teams for communication and collaboration.
- I use pyVISA and PyQt to control instruments and automate experiments. For data exploration and visualization, I use Jupyter notebooks, Pandas, Numpy, Scipy, Sympy, and Matplotlib. Specific problems always will require the use of other Python packages.
- I use Linux as a development and production environment, but sometimes in the lab, Windows is required.
- I have a strong preference for open-source software, but if I have access to competitive proprietary software like Comsol, Mathematica or Matlab, I will be able to use them too.

Interests

Microcomb technology

Optical sensing

Optical spectroscopy

Biophotonics

References

Two professors with whom I have worked very closely in my graduate and postgraduate studies are:

Dr. Carmen Eyzaguirre Professor at [Optics and Photonics Laboratory](#) - UNI. [✉ ceyzaguirre@uni.edu.pe](mailto:ceyzaguirre@uni.edu.pe)

Dr. Gustavo Wiederhecker Professor at [Device Research Laboratory](#) - UNICAMP. [✉ gsw@unicamp.br](mailto:gsw@unicamp.br)